

Threatened butterflies: a new subspecies of *Neptis manasa* Moore, 1858 from Hainan Island (Lepidoptera, Nymphalidae)

SONGYUN, LANG¹, DAYONG, XUE² & HONGXIANG, HAN^{3,4}

¹Key Laboratory of Zoological Systematics and Evolution, Institute of Zoology, Chinese Academy of Sciences, Beijing 100101 China & Graduate University of Chinese Academy of Sciences, Beijing 100049 China. E-mail: langsy@ioz.ac.cn, langsongyun@gmail.com

^{2,3}Key Laboratory of Zoological Systematics and Evolution, Institute of Zoology, Chinese Academy of Sciences, Beijing 100101.

E-mail: ²xuedy@ioz.ac.cn; ³hanhx@ioz.ac.cn.

⁴Corresponding author

Neptis manasa Moore, 1858, belonging to the tribe Neptini (Nymphalidae: Limenitidinae), is distributed along the northern border of the Oriental Region. So far, four subspecies have been recorded: *N. m. manasa* Moore, 1858 (North India to north Thailand), *N. m. antigone* Leech, 1890 (South China), *N. m. narcissina* Oberthür, 1906 (Northwest Yunnan, China) and *N. m. shinkaii* Koiwaya, 1996 (Southeast Tibet, China). *N. manasa* is very rare compared with most species of the genus *Neptis*. Restricted only to virgin forests, its habitats have been destroyed by the economic developments of China and neighbouring countries. Thus, *N. manasa* is likely to be threatened by losing its required habitats.

Gu (1997) first recorded *N. manasa* from Hainan Island and considered the insular race as the nominate subspecies. We studied two *N. manasa* specimens collected in the early 1980s by Mr. Gu from Hainan and found that the insular race is quite different from all known subspecies based upon external features and male genitalia. The purpose of this paper is to describe the insular race from Hainan Island as a new subspecies and bring attention to its probably threatened status.

Materials

The type specimens of the new subspecies are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS); the photographs of type specimens of *Neptis manasa* Moore, *N. m. antigone* Leech and *N. m. narcissina* Oberthür were provided by B. Huertas, the Natural History Museum, London, UK (former BMNH).

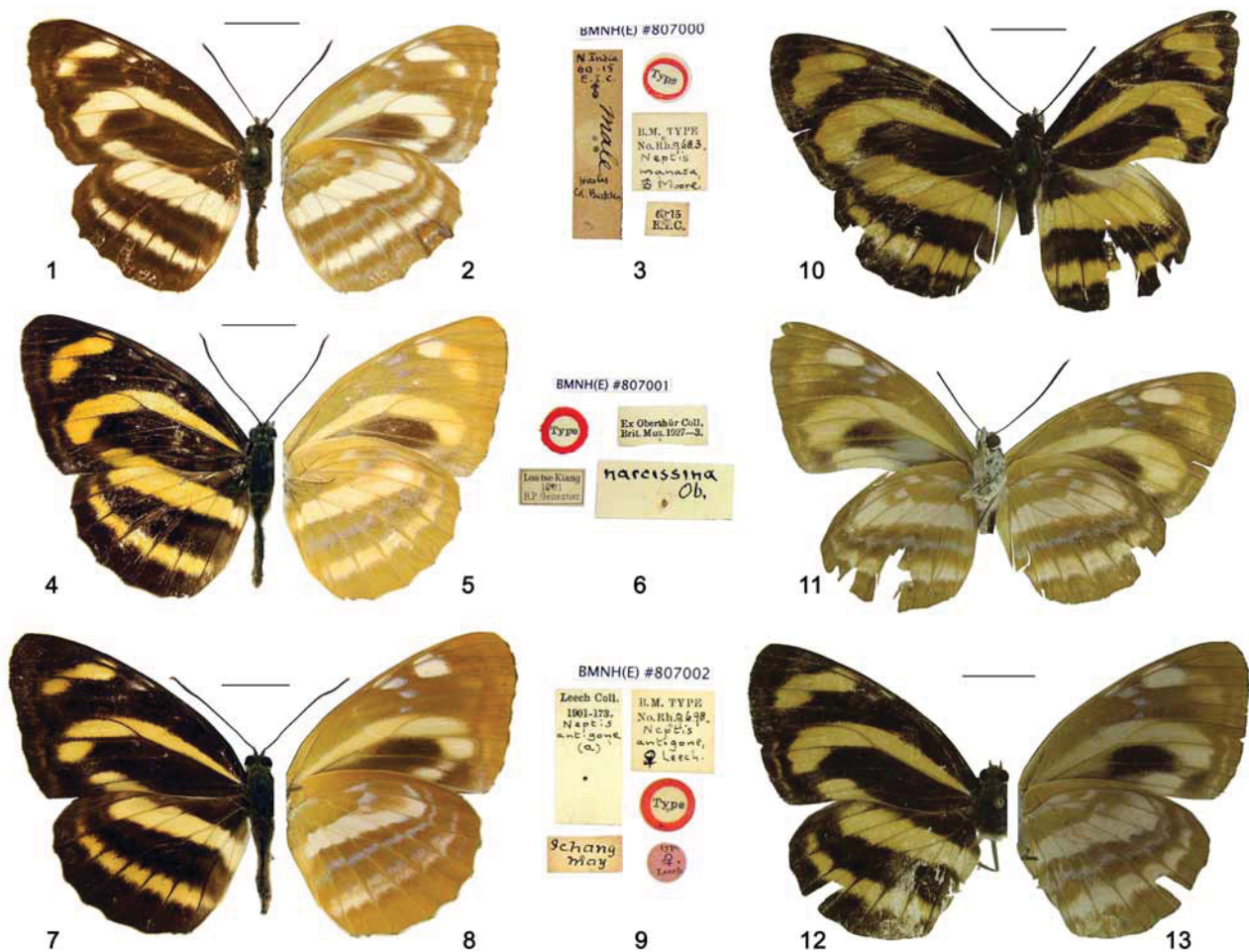
Neptis manasa hainana subspecies nov.

(Figs. 10–13)

Description. *Male.* Forewing length (base to apex): 35 mm. Wing pattern: Dorsal forewing with markings fresh yellow; upper postdiscal spots in spaces M_1 and R_5 wide, with outer edges concave inwards, spot in space M_1 partly extending into space M_2 ; lower postdiscal spots in spaces M_3 and Cu_1 developed, also with outer edges concave inwards, spots in spaces Cu_1 and Cu_2 nearly touching each other. Dorsal hindwing with colour of markings as in forewing; discal band broad, obviously expanding towards costal margin, its anterior edge broad, nearly twice width of posterior edge. Ventral forewing with ground colour yellowish brown; subcostal spots distinct, sky-blue; ‘hockey stick’-shaped marking pale yellow; upper postdiscal band yellowish, vague, spot in space R_5 oval, creamy. Ventral hindwing with ground colour as in forewing; subbasal streak composed of greyish white trivial spots; discal band creamy, evenly wide; discal fascia grey-blue; postdiscal band creamy with its central area slightly stained by ground colour scales; submarginal fascia absent. Male genitalia (Fig. 14): Costa and sacculus clearly differentiated; costa with the apical one third protruding; a small canine-like process present on the base of the protrusion; terminal process finger-like, extending and tapering, short and straight.

Female. Forewing length: 36 mm. Wing pattern: Dorsal forewing similar to male, but markings narrower; upper postdiscal spot in space R_5 with its outer edge not conspicuously concave inwards, spot in space M_1 only one half width of

spot in space R_5 and not extending into space M_2 downwards; the interval between lower postdiscal spots in spaces Cu_1 and Cu_2 large. Dorsal hindwing with discal band only slightly expanding towards costal margin. Ventral side almost the same as in male, but somewhat darker.



FIGURES 1–13. Butterflies of *Neptis manasa*. 1, *Neptis manasa manasa* Moore, type (N. India), dorsal; 2, ibidem, ventral; 3, ibidem, labels; 4, *N. m. narcissina* Oberthür, type (Lou-tse-Kiang), dorsal; 5, ibidem, ventral; 6, ibidem, labels; 7, *N. m. antigone* Leech, type (Ichang), dorsal; 8, ibidem, ventral; 9, ibidem, labels © Natural History Museum; 10, *N. m. hainana* subsp. nov., holotype ♂ (Hainan Island), dorsal; 11, ibidem, ventral; 12, *N. m. hainana* subsp. nov., paratype ♀ (Hainan Island), dorsal; 13, ibidem, ventral. Scale bar = 10 mm.

Diagnosis. The new subspecies can be distinguished from other subspecies by the following characters: 1) wing markings on dorsal surface are fresh yellow, whereas they are creamy in subspecies *manasa* (Figs. 1–3), golden yellow in subspecies *narcissina* (Figs. 4–6), orange yellow in subspecies *antigone* (Figs. 7–9) and white in subspecies *shinkaii*; 2) wing markings on the dorsal surface in males, especially on the hindwing, are very wide and occupy the greater part of the wing surface, while in other subspecies the dorsal wing markings are much narrower; 3) on the dorsal forewing in males, the interval between the lower postdiscal spots in spaces Cu_1 and Cu_2 is much narrower, whereas it is wider in other subspecies; 4) the discal band of the dorsal hindwing in males is expanding towards the costal margin, whereas in the subspecies *manasa* and *shinkaii* the band is of equal width throughout; 5) the ground colour of the ventral surface is yellowish brown, but is orange yellow in subspecies *narcissina* and reddish brown in subspecies *antigone*.

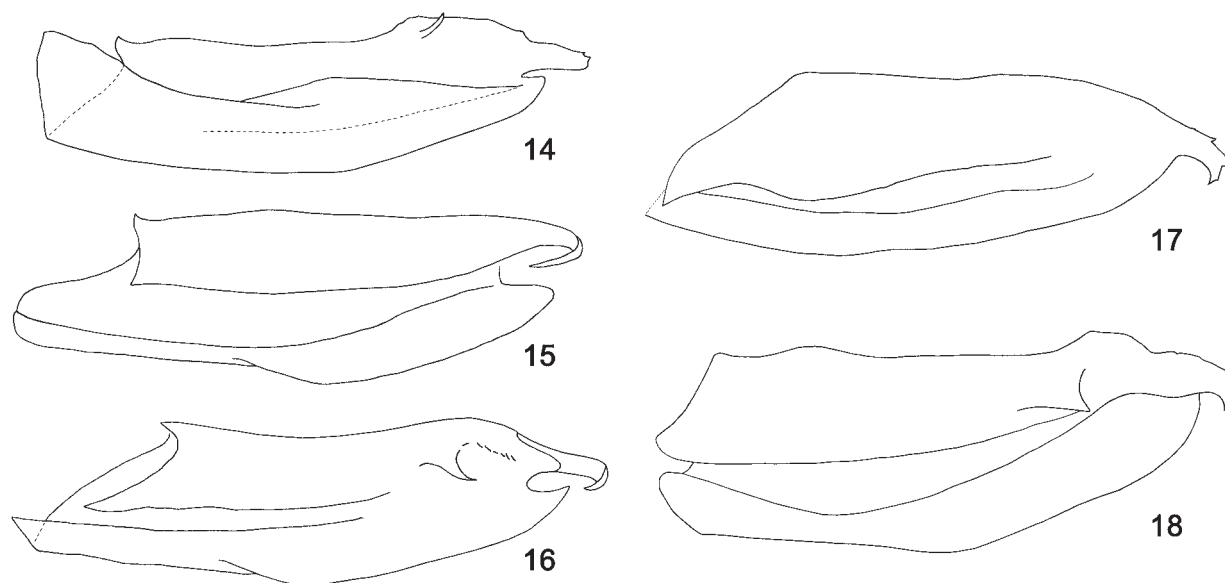
Although this should be confirmed with larger samples and direct comparison of genitalia, the valva of the male genitalia appear quite different among subspecies in available materials. A small dorsal process and a short and straight terminal process are present in subspecies *hainana*. The former process is absent in all other subspecies. The latter process in other subspecies is various but different from that of subspecies *hainana*: it is long and with its apical half bending inwards and backwards in subspecies *manasa* (Fig. 15) and subspecies *antigone* (Fig. 16); it is beak-like, short and bending downwards in subspecies *narcissina* (Fig. 17) and subspecies *shinkaii* (Fig. 18). The apical one third portion

of costa is protruding upwards in subspecies *hainana*, whereas the costal dorsal edge is straight in subspecies *manasa*. Types. Holotype ♂, CHINA: Hainan: Mt. Jianfengling, 1.III.1982, coll. Gu Mao-bin (IZCAS); Paratype, ♀, Hainan: Mt. Jianfengling, 13.V.1983, coll. Gu Mao-bin (antennae and abdomen missing) (IZCAS).

Etymology. The subspecific name *hainana* is named after Hainan Island.

Distribution. China (Hainan Island).

Notes. Excepting the type locality, the Mt. Jianfengling area, no further sites have been recorded in Hainan for this new subspecies. Several entomological expeditions to Hainan Island were organized during the last two years, but no new material of this new subspecies was found. The natural ecosystems of Hainan Island have been rapidly destroyed and virgin rainforests have been replaced by simpler secondary economic forests such as rubber tree plantations in the last two decades. Therefore, the new subspecies is likely to be threatened.



FIGURES 14–18. Right valva of male genitalia. 14, *Neptis manasa hainana* subsp. nov.; 15, *N. m. manasa* Moore, (after Eliot, 1969); 16, *N. m. antigone* Leech, (traced from Huang, 1998); 17, *N. m. narcissina* Oberthür, (traced from Huang, 2003); 18, *N. m. shinkaii*, (traced from Huang, 2003).

Acknowledgements

We express our sincere thanks to B. Huertas, the Natural History Museum, London, United Kingdom, for providing photographs of available types. This project was supported by the Key Project of Scientific Innovation of CAS (KSCX2-YW-Z-006).

References

- Eliot, J.N. (1969) An analysis of the Eurasian and Australian Neptini (Lepidoptera: Nymphalidae). *Bulletin of the British Museum (Natural History) Entomology, Suppl.* 15, 1–155, pls. 1–3.
- Gu, M.B. & Chen, P.Z. (1997) *Butterflies in Hainan Island*. China Forestry Publishing House, Beijing, 355 pp.
- Moore, F. (1858) In: Horsfield, T. & Moore, F. *Catalogue of the Lepidopterous Insects in the Museum of the Honourable East India Company* 1. London, 298 pp., 18 pls.
- Huang, H. (1998) Research on the butterflies of the Namjagbarwa region, S.E. Tibet (Lepidoptera: Rhopalocera). *Neue Entomologische Nachrichten*, 41, 207–263.
- Huang, H. (2003) A list of butterflies collected from Nujiang (Lou Tse Kiang) and Dulongjiang, China with descriptions of new species, new subspecies, and revisional notes (Lepidoptera, Rhopalocera). *Neue Entomologische Nachrichten*, 55, 3–114, 160–177.
- Koiwaya, S. (1996) Ten new species and twenty-four new subspecies of butterflies from China, with notes on the

- systematic positions of five taxa. In: Koiwaya, S. (Ed.), *Studies of Chinese butterflies*, 3. Tokyo, 237–280, pls. 168–202.
- Leech, J.H. (1890) New species of Lepidoptera from China. *Entomologist*, 23, 26–50, 81–83, 109–114, 187–192.
- Oberthür, C. (1906) Observations sur les *Neptis* à tâches jaunes de la région sino-thibétaine. *Études de Lépidoptérologie comparée*, 2, 7–18.